SmartWatch Users Guide

INTRODUCTION

The SmartWatch is a sophisticated state-of-the-art integrated circuit which can easily be installed in your personal computer to keep time down to 1/100 of a second. The SmartWatch imbeds a clock chip and a lithium energy source inside the hollow of a 28-pin DIP socket. This socket is designed to be inserted into either an empty or occupied ROM socket within your personal computer. If the ROM socket is occupied, the integrated circuit that belongs in the socket is then plugged into the SmartWatch. Once installed in your computer the SmartWatch software can be used to automatically set the MS-DOS date and time. The SmartWatch automatically compensates for months with 31 days and even corrects for Leap Year.

The lithium energy cells which are built into the SmartWatch maintain the clock and calendar time for over ten years in the absence of power to an accuracy within one minute a month. The SmartWatch also saves I/O slot space since it is mounted under a ROM IC and takes up no more area than the ROM alone.

Please take the time to read through this guide prior to installing the SmartWatch in your computer. This text will guide you through the installation and operation of the SmartWatch.

BEFORE YOU BEGIN

- WARNING! Leave the SmartWatch in its anti-static shipping foam until actual installation to prevent damage caused by static electricity.
- BEFORE you install the SmartWatch, be sure your computer operates properly.
- If you have a hard disk drive installed in your computer, run the ship utility before you proceed. (Refer to the MS-DOS documentation for instruction.)
- Disconnect the computer AC power cord.
- Disconnect any peripherals that are attached to the computer.

REQUIRED TOOLS

You will need some tools to install the SmartWatch in your computer. While the tools required will vary depending on the model of your computer, the list below should be adequate.

- ¼" blade straight-slot screwdriver
- Phillips screwdriver
- ¼" nut driver
- Long-nose pliers

INSTALLATION

You should consult your owner's manual on your personal computer for instructions on removing the cover and locating the appropriate printed circuit board which contains the ROM or ROM socket where the SmartWatch will be installed.

IDENTIFYING THE ROM SOCKET

The location of the ROM socket where the SmartWatch will be installed is dependent on your computer model. In some cases you may be required to remove one or more printed circuit cards and/or disk drives in order to get access to the appropriate ROM socket. In most cases, the ROM or ROM socket will be located on the mother board of your computer. The mother board is the largest printed circuit card within the computer and contains the expansion card receptacles. Often there is more than a single ROM or ROM socket on the computer mother board. In this case any of the ROM or ROM sockets may be used for the SmartWatch. If a ROM socket is unoccupied, *i.e.*, contains no ROM integrated circuit, it may be the best choice because it simplifies installation. The ROM is a 28-pin integrated circuit which looks as shown in Figure 1.

REMOVING THE ROM (Refer to Figures 1-5)

Depending on the model of your computer, a ROM may have to be removed and reinstalled on the top of the SmartWatch. If the ROM must be removed, care must be taken to avoid bending pins. A small straight-slot screwdriver can be used to gently pry the ROM from its socket site. The ROM should be lifted out evenly by lifting one end and then the other in a gentle rocking manner to avoid bending pins (see Figure 1). After you remove the ROM I.C. you should place it on a metal surface of your computer until you are ready to reinstall it on top of the SmartWatch.

CAUTION: Both the ROM I.C. and the SmartWatch can be damaged by static electricity. To avoid static damage, place the devices on a metal surface while they are waiting to be installed.

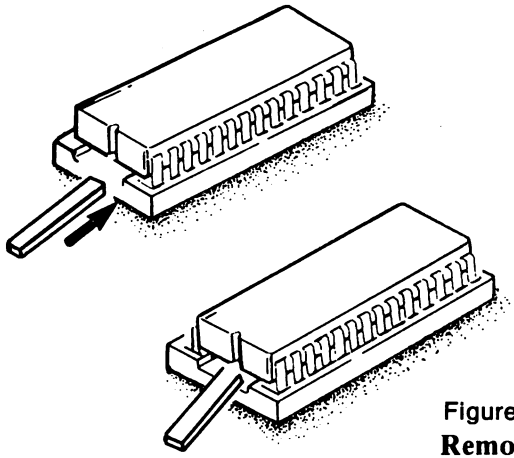

Figure 1
Removing an IC

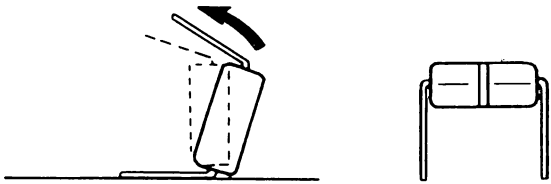

Figure 2
Bending pins on an IC

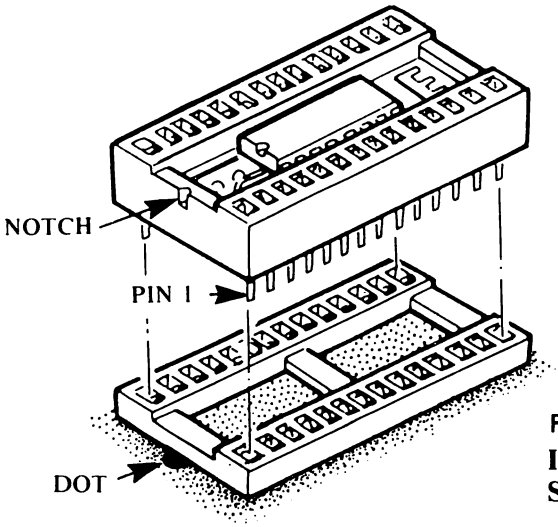

Figure 3
Installing the SmartWatch

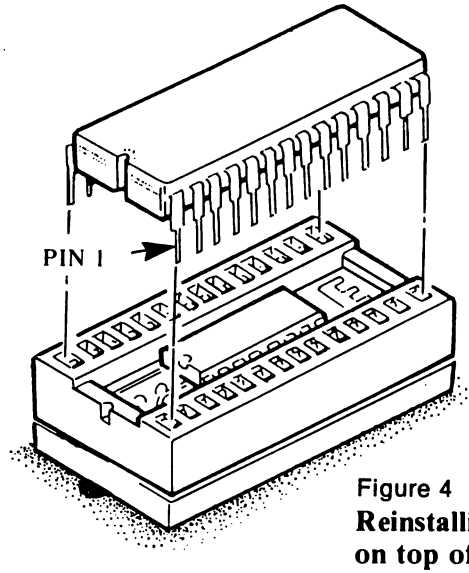

Figure 4
Reinstalling a ROM on top of SmartWatch

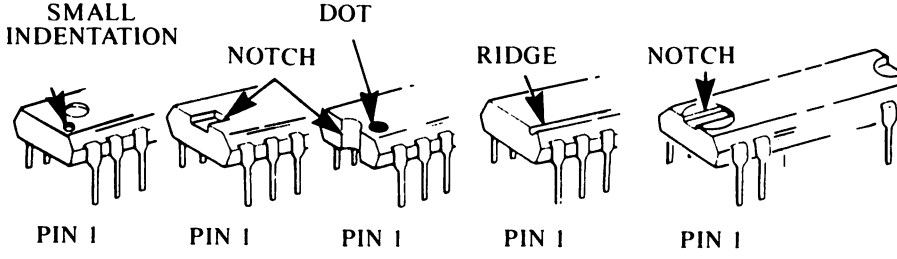

Figure 5
Identifying marks on ROM chips

INSTALLING THE SMARTWATCH

When you install the SmartWatch and reinstall the ROM, all pins must line up perfectly with the holes of the mating socket. You may need to straighten the leads of the ROM and SmartSocket for proper insertion. To straighten the leads, hold the ROM or SmartWatch in one hand and place the other hand on a metal work surface before you touch the ROM or SmartWatch to that surface. This will equalize the static charge between the work surface and the ROM or SmartWatch. While holding the device, lay it down on its side as shown in Figure 2 and very carefully roll it towards the pins to bend the lower pins into line. Then turn the ROM over and bend the pins on the other side in the same manner.

When you install the SmartWatch into the ROM socket, the pin orientation must be correct. Pin 1 can be identified by a notch which is located on the Pin 1 end of the socket (see Figure 3). After you locate Pin 1 on the SmartSocket and Pin 1 on the ROM socket make sure that all of the pins are properly aligned and started into the socket. Then press the SmartWatch into the ROM socket.

NOTE: A pin on the SmartWatch can become bent under the device and it will apear as though it is correctly installed in the ROM socket. Be careful that this does not happen. If you have a problem after installation, check the SmartWatch (remove it, if necessary) to be certain all pins are correctly inserted.

REINSTALLING THE ROM INTO THE SMARTWATCH

After the SmartWatch is correctly installed into the ROM socket, you will need to reinstall the ROM into the SmartWatch socket. Once again, make certain the Pin 1 end is positioned correctly (see Figure 4 and Figure 5).

CLOSING THE COMPUTER CABINET

Again, you should consult your owner's manual on your personal computer for instructions on reassembling your computer. If you have removed disk drives or printed circuit boards, they must be correctly replaced before the computer cabinet is closed. After completing the reassembly procedure, you can reconnect all peripherals that were previously connected to your computer and plug in the power line cord. Be sure to double-check all of the assembly work before applying power.

This completes the installation of the SmartWatch.

USING THE SMARTWATCH

The SmartWatch comes with a utility diskette which has a program to read and set time. There are three instructions which serve to permanently link the SmartWatch to MS-DOS.

The instructions are as follows:

SMWCLOCK - This instruction finds the SmartWatch and displays the SmartWatch date and time on the monitor.

SMWCLOCK C - This instruction transfers the value of time and date which is resident in MS-DOS to the SmartWatch.

SMWCLOCK S - This instruction transfers the value of time and date which is resident in the SmartWatch to MS-DOS.

The step-by-step procedure for linking software supplied with the SmartWatch to MS-DOS follows:

1. Turn on your computer and boot up the MS-DOS operating system.
2. Next, using the MS-DOS "Copy" command, copy the entire floppy disk you received with the SmartWatch onto your MS-DOS disk or diskette. The appropriate command is "COPY [SOURCE DRIVE]:*.* [TARGET DRIVE]:"
3. Enter the correct time value into MS-DOS using the "time" comand. (Again, consult the MS-DOS manual if you are not familiar with this command.)
4. Enter the correct date value into MS-DOS using the "date" command.
5. Now type "SMWCLOCK C" and press the return key. This will update the SmartWatch with the time and date you have just entered into DOS.
6. To have the correct time entered for you when you boot up your system, it will be necessary to modify (or create) an "AUTOEXEC.BAT" file. This is the file that MS-DOS automatically looks for every time you boot up. MS-DOS will run the commands that the "AUTOEXEC.BAT" file contains, one after another.

   If you already have an "AUTOEXEC.BAT" file, follow the instructions in your MS-DOS manual to add a line which says "SMWCLOCK S" in the file. (If you create a new "AUTOEXEC.BAT" file, the existing one will be destroyed.) If you want to create a new "AUTOEXEC.BAT" file, at the system prompt type:

   "COPY CON: AUTOEXEC.BAT"

   then press the return key. When nothing obvious happens, the next things typed will be entered in the "AUTOEXEC.BAT" file. Now type:

   "SMWCLOCK S"

   then press the return key. Press "F6" or "Control Z" to close the "AUTOEXEC.BAT" file. Now MS-DOS will run the clock function whenever MS-DOS is started.

This concludes the physical installation and linking of software for the SmartWatch.